

## Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.











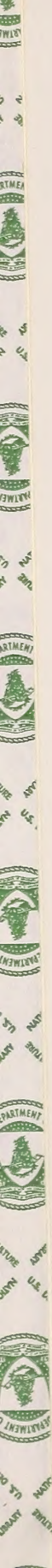








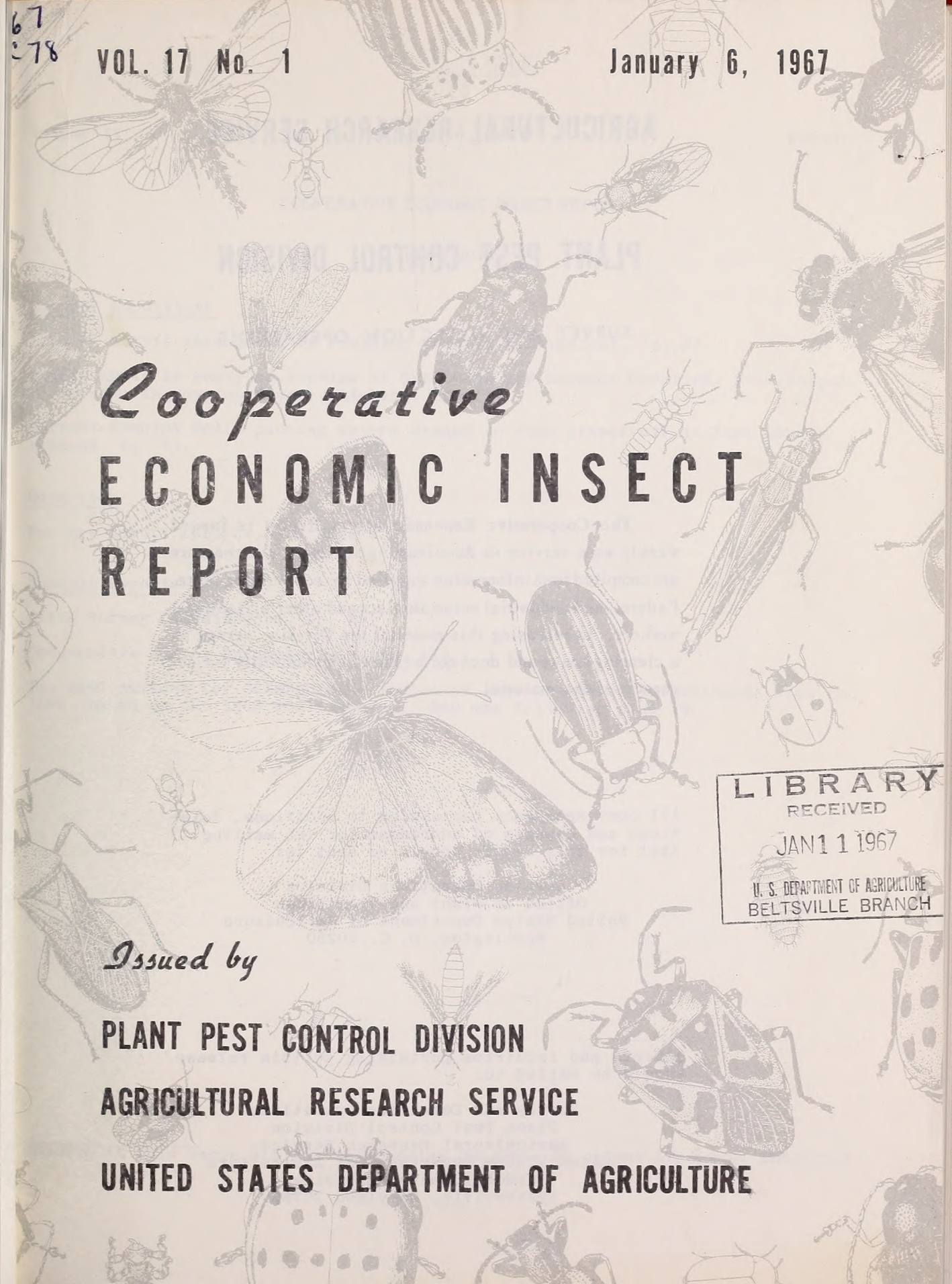






67  
78  
VOL. 17 No. 1

January 6, 1967



*Cooperative*  
**ECONOMIC INSECT  
REPORT**

**LIBRARY**  
RECEIVED

JAN 11 1967

U. S. DEPARTMENT OF AGRICULTURE  
BELTSVILLE BRANCH

*Issued by*

**PLANT PEST CONTROL DIVISION**

**AGRICULTURAL RESEARCH SERVICE**

**UNITED STATES DEPARTMENT OF AGRICULTURE**



# AGRICULTURAL RESEARCH SERVICE

## PLANT PEST CONTROL DIVISION

### SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearinghouse and does not assume responsibility for accuracy of the material.

All correspondence pertaining to additions, deletions and changes of addresses for the mailing list for this report should be sent to:

Service Operations Division  
Office of Plant and Operations  
United States Department of Agriculture  
Washington, D. C. 20250

Reports and inquiries pertaining to this release should be mailed to:

Survey and Detection Operations  
Plant Pest Control Division  
Agricultural Research Service  
United States Department of Agriculture  
Federal Center Building  
Hyattsville, Maryland 20782



## COOPERATIVE ECONOMIC INSECT REPORT

## HIGHLIGHTS

Current Conditions

ALFALFA WEEVIL increasing in Pontotoc County, Mississippi. (p. 3).

TURNIP APHID is heavy on turnips in Oktibbeha and Lowndes Counties, Mississippi; increasing in Houston County, Alabama. (p. 4).

COTTONY-CUSHION SCALE causing severe damage to some grapefruit in Yuma County, Arizona. (p. 4).

Detection

For new county records, see page 6.

Special Reports

State Survey Coordinators. (p. 8).

Cooperative Survey Entomologists. (p. 11).

The 1967 outlook for GRASSHOPPERS indicates less extensive infestations than in 1966, based on the 1966 adult survey. See map following page 12.

Reports in this issue are for week ending December 30 unless otherwise indicated.



CONTENTS

Special Insects of Regional Significance.....3

Insects Affecting

Small Grains.....3	Deciduous Fruits and Nuts.....4
Turf, Pastures, Rangeland.....3	Citrus.....4
Forage Legumes.....3	Ornamentals.....4
Sugarbeets.....3	Forest and Shade Trees.....5
Cole Crops.....3	Man and Animals.....5
General Vegetables.....4	Households and Structures.....6

Federal and State Plant Protection Programs.....6

Insect Detection.....6

Light Trap Collections.....6

Hawaii Insect Report.....7

State Survey Coordinators.....8

Cooperative Survey Entomologists.....11

Grasshopper Adult Survey, Fall 1966 (Map). Following page 12.

WEATHER BUREAU'S 30-DAY OUTLOOK

JANUARY 1967

The Weather Bureau's 30-day outlook for January 1967 is for temperatures to average below seasonal normals across the Nation except for near normal in south and north Atlantic Coastal States and also in the Great Lakes region. Precipitation is expected to exceed normal over the southern half of the Nation except for near normal totals over the central Pacific coast and parts of the southern Plains. Subnormal precipitation is called for in the far Northwest and also in the Great Lakes region while near normal amounts are indicated in unspecified areas.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the Weather Bureau. You can subscribe through the Superintendent of Documents, Washington, D. C. 20250. Price \$5.00 a year.

Weather of the week continued on page 7.

### SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

GREENBUG (Schizaphis graminum) - OKLAHOMA - Ranged 0-12 per linear foot in Mayes County wheat. Extremely cold weather reduced numbers to very low level in Payne County. (Okla. Coop. Sur.).

SPOTTED ALFALFA APHID (Therioaphis maculata) - MISSISSIPPI - Nymphs and adults light on alfalfa in Oktibbeha County; 5-10 aphids per square foot. (Dinkins, Dec. 23). OKLAHOMA - Heavy in localized areas of Mayes County. (Okla. Coop. Sur.).

### SMALL GRAINS

CHINCH BUG (Blissus leucopterus) - MISSOURI - Survey conducted in 11 counties; St. Clair County light, remainder noneconomic. (Munson). OKLAHOMA - Samples of overwintering habitats indicate less than 10 per square foot in Payne County. (Okla. Coop. Sur.).

ENGLISH GRAIN APHID (Macrosiphum avenae) - OKLAHOMA - Ranged 1-6 per linear foot in Mayes County wheat. (Okla. Coop. Sur.).

### TURF, PASTURES, RANGELAND

A BILLBUG (Sphenophorus phoeniciensis) - ARIZONA - Medium in many lawns in Salt River Valley. Adults have laid eggs and second and third instar larvae now feeding on roots. (Ariz. Coop. Sur.).

### FORAGE LEGUMES

ALFALFA WEEVIL (Hypera postica) - MISSISSIPPI - Moderate on alfalfa in Attala County; 5-10 larvae per square foot, mostly of first and second instar, week ending December 23. Increasing in Pontotoc County; larvae 20-25 per square foot. (Dinkins).

CLOVER LEAF WEEVIL (Hypera punctata) - OKLAHOMA - Low in Mayes County alfalfa. (Okla. Coop. Sur.).

PEA APHID (Acyrtosiphon pisum) - MISSISSIPPI - Nymphs and adults heavy on alfalfa in Attala County; 30-40 aphids per square foot. (Dinkins, Dec. 23). OKLAHOMA - Heavy in localized areas of Mayes County; light on fall-seeded vetch. (Okla. Coop. Sur.).

### SUGARBEETS

BET ARMYWORM (Spodoptera exigua) - ARIZONA - Continues to show reduction in Maricopa and Pinal County sugarbeets. (Ariz. Coop. Sur.).

### COLE CROPS

SPOTTED CUCUMBER BEETLE (Diabrotica undecimpunctata howardi) - ALABAMA - Adults numerous, feeding on turnip leaves throughout Houston County. No damage observed. (Roney).

GREEN PEACH APHID (Myzus persicae) - FLORIDA - Total of 1,088 collected from 100 cabbage plants at Sanford, Seminole County; 884 wingless and 204 winged. (Greene, Dec. 23).



TURNIP APHID (Hyadaphis pseudobrassicae) - ALABAMA - Increasing on commercial turnips in Houston County, and on turnips and mustard in home gardens throughout State. (Roney et al.). MISSISSIPPI - Very heavy on turnips in Oktibbeha and Lowndes Counties. Leaf damage severe on some plants. (Dinkins).

#### GENERAL VEGETABLES

TULIP BULB APHID (Anuraphis tulipae) - UTAH - Infesting carrots in storage pit at Providence, Cache County. (Knowlton).

#### DECIDUOUS FRUITS AND NUTS

BLACK PECAN APHID (Myzocallis caryaefoliae) - ALABAMA - Unusual and large numbers of adults observed clustering on branches and twigs of pecans in Houston County orchard. Grower considering control. (Roney).

SAN JOSE SCALE (Aspidiotus perniciosus) - ALABAMA - Dormant individuals light to heavy on peach trees in Lee County. Lighter on apple, pear and plum trees. (McQueen).

#### CITRUS

COTTONY-CUSHION SCALE (Icerya purchasi) - ARIZONA - Populations causing severe damage to some grapefruit in Yuma County. (Ariz. Coop. Sur.). CALIFORNIA - Medium on lemon trees in Placerville, El Dorado County. Mild weather has allowed vedalia to be active. (Cal. Coop. Rpt.).

GREEN SCALE (Coccus viridis) - FLORIDA - Adults infested 95 percent of orange trees in nursery at Winter Haven, Polk County. (Eisenschenk, Skipper, Dec. 14).

#### ORNAMENTALS

APHIDS - NEW MEXICO - Light to moderate on potted chrysanthemums and bedding plants in greenhouse at Tularosa, Otero County, and on chrysanthemums in Albuquerque. (Elson, Kloepfer). CALIFORNIA - Aphis nerii heavy on oleander along highway in Davis, Yolo County. (Cal. Coop. Rpt.).

A WAX SCALE (Ceroplastes ceriferus) - FLORIDA - All stages severely infesting 80 percent of 2,000 podocarpus plants in nursery at Davie, Broward County. (Shirah, Dec. 14).

AZALEA BARK SCALE (Eriococcus azaleae) - ALABAMA - Second-year planting of 25 azalea plants in Lee County heavily damaged; several specimens have died. Plants were infested prior to planting. Similar infestations observed in Dallas County. (McQueen, Dec. 23).

TEA SCALE (Fiorinia theae) - ALABAMA - Heavy on leaves of old camellias at many Tallassee homes in Elmore County. Weakened shrubs contain only 40-60 percent of normal leaves. Buds and flowering reduced considerably. (McQueen).

MEALYBUGS - NEW MEXICO - Unspecified species light to very heavy and apparently killing some Chinese evergreens in Albuquerque, Bernalillo County. (Heninger).

SPIDER MITES - NEW MEXICO - Light to very heavy on ivy, croton, schefflera and other greenhouse plants in Albuquerque area, Bernalillo County. (Heninger).

#### FOREST AND SHADE TREES

FOREST TENT CATERPILLAR (Malacosoma disstria) - MINNESOTA - Egg surveys indicate areas infested and egg mass levels appear about same as last year. Survey still in progress. (Minn. Ins. Rpt.).

RED TURPENTINE BEETLE (Dendroctonus valens) - CALIFORNIA - Locally heavy in pine at Los Gatos, Santa Clara County. (Cal. Coop. Rpt.).

SARATOGA SPITTLEBUG (Aphrophora saratogensis) - MINNESOTA - Surveys indicate infestation extends outside Pine Island State Forest southward to Northome area. (Minn. Ins. Rpt., Dec. 23).

APHIDS (Eulachnus spp.) - ALABAMA - Continue to feed and increase on pine needles in central section of State causing objectionable honeydew on cars parked below. (McQueen, Dec. 23).

A GALL MIDGE (Contarinia sp.) - CALIFORNIA - Causing varying degrees of defoliation to Douglas-fir in 6,000-acre stand in Bluff Creek area and 15,000 acres in Red Cap Creek drainage of Six Rivers National Forest. Shaded and depressed trees most severely affected. (Cal. Coop. Rpt.).

#### MAN AND ANIMALS

COMMON CATTLE GRUB (Hypoderma lineatum) - OKLAHOMA - Averaged 30 grubs per yearling steer in Payne County. Ranged 15-18 per animal on mature cows. Populations appreciably higher in animals slaughtered at Oklahoma City. (Okla. Coop. Sur.).

SCREW-WORM (Cochliomyia hominivorax) - Total of 4 cases reported in U. S. December 25-31 as follows: TEXAS - Starr 1, Webb 1. CALIFORNIA - Imperial 2. Total of 147 cases reported in portion of Barrier Zone in Republic of Mexico as follows: Territorio sur de Baja California 27, Sonora 89, Chihuahua 13, Coahuila 1, Nuevo Leon 8, Tamaulipas 10. Total of 7 cases reported from Mexico south of the Barrier Zone. Barrier Zone is area where eradication operations underway to prevent establishment of self-sustaining population in U. S. Sterile screw-worm flies released: Texas 17,966,250, Arizona 6,864,000, Mexico 67,148,000, California 1,716,000. (Anim. Health Div.).

CATTLE LICE - ALABAMA - Bovicola bovis and Haematopinus eurytarnus detected in many herds of beef cattle in Wilcox County. (Farquhar). UTAH - Lice becoming numerous in Box Elder and Beaver Counties. (Knowlton, Esplin).

HOUSE FLY (Musca domestica) - ARKANSAS - Year around problem in new type "environmental controlled" laying houses throughout State. (Simco).

MOSQUITOES - CALIFORNIA - Populations dropped abruptly with advent of cool damp weather. Arthropod-borne encephalitis from July through September 1966 included 9 cases of western encephalitis and 8 of St. Louis encephalitis in northern and central areas. All but 3 cases were males from 2 months to 29 years old. (Cal. Coop. Rpt.).

NORTHERN FOWL MITE (Ornithonyssus sylviarum) - MISSISSIPPI - Light to moderate on caged laying hens in Oktibbeha County. (Dinkins).



A BROWN SPIDER (Loxosceles reclusa) - OKLAHOMA - Causing concern in homes throughout eastern section of State. (Okla. Coop. Sur.).

WINTER TICK (Dermacentor albipictus) - OKLAHOMA - Larvae, nymphs and adults heavy (1,000-2,000) on horses in restricted areas of eastern part of State. Cattle less heavily infested, 100-500 nymphs and adults in scattered areas. (Okla. Coop. Sur.)

#### FEDERAL & STATE PLANT PROTECTION PROGRAMS

ORIENTAL FRUIT FLY (Dacus dorsalis) - CALIFORNIA - Single male taken in trap at Anaheim, Orange County. This is fourth fly taken in area. Time lapse indicates possible slow emergence from single source. Fruit cutting continues negative. Up to 50 traps per square mile in vicinity of present catches. (Cal. Coop. Rpt.).

CARIBBEAN FRUIT FLY (Anastrepha suspensa) - FLORIDA - Few dead adult flies found in cages where suspect fruits, Ceylon peach and mango, had been placed in June 1966, at Miami, Dade County. (DeHaven, Brewton).

CITRUS WHITEFLY (Dialeurodes citri) - CALIFORNIA - Survey in San Diego County produced additional infested blocks. Treatment in known infested area progressing. Some extensions occurred in known infested areas of Sacramento, Sacramento County and Fresno, Fresno County. These infestations light. (Cal. Coop. Rpt.).

#### INSECT DETECTION

##### New County Records

A SNAIL (Rumina decollata) - CALIFORNIA - Adults light under lumber pile at Ojai, Ventura County. This represents northwesterly spread of 60 miles from Los Angeles; also known to occur at Bakersfield, Kern County. (Cal. Coop. Rpt.).

A BARK BEETLE (Xylosandrus compactus) - HAWAII - Collected on Hawaii Island. (p. 7).

AN ARMORED SCALE (Pseudaulacaspis major) - Collected at Lawai, Kauai. (p. 7).

#### LIGHT TRAP COLLECTIONS

GEORGIA - Tifton, 12/22-28, 1 blacklight trap, temperature 21-67°, precipitation 0.24 - Corn earworm (Heliothis zea) 1. FLORIDA - Gainesville, 12/27, 1 BL - Granulate cutworm (Feltia subterranea) 1, armyworm (Pseudaletia unipuncta) 3. Seminole - 12/19-21, 1 BL - Black cutworm (Agrotis ipsilon) 1, granulate cutworm 12, cabbage looper (Trichoplusia ni) 1. TEXAS - Brownsville, 12/17-23, 2 BL, temperature 41-80°, precipitation 0.09 - Black cutworm 31, salt-marsh caterpillar (Estigmene acrea) 1, granulate cutworm 35, corn earworm 3, variegated cutworm (Peridroma saucia) 16, yellow-striped armyworm (Prodenia ornithogalli) 12, armyworm 99, beet armyworm (Spodoptera exigua) 37, fall armyworm (S. frugiperda) 17, cabbage looper 25.

HAWAII INSECT REPORT

Turf, Pastureland - Populations of a BILLBUG (Sphenophorus venatus vestitus) remain light on Kikuyu grass pastureland in Kohala, Hawaii Island. Considerable damage to rhizomes occurred from previous infestations. Presently overwintering; serious damage may result in spring if rains cease. (LaPlante).

Fruits - A BARK BEETLE (Xylosandrus compactus) found established for first time on Hawaii Island. Adults damaging young custard-apple (Annona reticulata) at Waiakea Experimental Farm in Hilo. Acacia koa and several other plants also believed infested as emergence holes quite noticeable and terminals of some plants severely damaged. Surveys continuing. (Yoshioka). BARNACLE SCALE (Ceroplastes cirripediformis) remains serious on 200-acre passion-fruit farm at Kahului, Maui. Control application reduced adult population but nymphs remained extremely heavy in spotted areas. (Miyahira). An ARMORED SCALE (Pseudaulacaspis major) medium to heavy and causing considerable damage to young Litchi chinensis twigs in Lawai, Kauai. Scales congregated near terminals. This insect previously reported only from Oahu. (Au). Heavy populations of ORIENTAL FRUIT FLY (Dacus dorsalis) noted during November in Hilo, Hawaii Island; 1,045 guava fruits sampled from scattered areas yielded 3,929 pupae (41 percent parasitized) and 1,523 tropical-almond (Terminalia catappa) from Onekahakaha Beach yielded 10,444 pupae (65 percent parasitized). Parasitism mostly by Opius oophilus. (Hawaii Fruit Fly Investigations).

Miscellaneous - Larvae of a NOCTUID MOTH (Achaea janata) heavy on residential buildings in Kahului, Maui. Larvae light on graceful spurge (Euphorbia glomerifera) and adults medium in Hawaii and Kai areas, Oahu. (Miyahira, Nakao).

WEATHER OF THE WEEK ENDING JANUARY 2, 1967

HIGHLIGHTS: A week of cold temperatures in the central Rockies and the western Plains with heavy snow from the southern Rockies to New England, and generous rains in the Deep South.

PRECIPITATION: A storm developed over northeastern Arizona early in the week, clogging the highways of northern Arizona with snow and hampering traffic in northern New Mexico. After dumping heavy snow in the central and southern Rockies, the storm moved to the Great Plains, becoming the worst blizzard of this season. Winds reached 40-50 miles per hour while temperatures plunged to near zero. Snowfall ranged from 8 to 12 inches over parts of Nebraska and Kansas northeastward across southern Iowa and northern Missouri to southern Wisconsin and northern Illinois. Strong winds piled the snow in drifts several feet deep. South of the snow belt, freezing rain iced trees and wires, making for beautiful scenery but treacherous sidewalks, streets and highways from Missouri eastward to Kentucky and Virginia and northeastward across Maryland, eastern Pennsylvania and New York to New England. Generous rains fell over the Southland, visiting the lower Mississippi Valley early in the week and most of the Southeast on Wednesday, where numerous stations registered an inch or more. Locally heavy rains soaked the Deep South over the weekend with some areas from Louisiana to the Carolinas receiving several inches. The rains spread northward across Tennessee and Kentucky mixing with snow in the Ohio River Valley. Light rain occurred almost daily in the lower elevations in western Washington with snow at higher levels in the Cascades and eastward to the Rockies. Central and southeastern New Mexico and the western sections of Texas continued with little precipitation of consequence.

TEMPERATURE: Cold wintery weather gripped most of the Great Plains and the East as northerly winds continued to bring polar air from Canada in the far north. Subzero temperatures were common over parts of the northern and central Great Plains and at mountain stations to the west, with temperatures ranging down to -28° in the Colorado Rockies. Subfreezing temperatures occurred in 49 States on Wednesday. Readings in the 20's were reported as far south as southeastern Arizona, and in the Everglades of Florida. Over much of Utah, Colorado, Nebraska, Kansas, Arizona, New Mexico, Oklahoma and Texas, temperatures averaged 10° or more below normal. (Summary supplied by Environmental Data Service, ESSA).



STATE SURVEY COORDINATORS

For Economic Insect Survey Reports

Alabama	Dr. F. S. Arant, Head, Department of Zoology-Entomology, Auburn University, Auburn 36830
Alaska	Dr. Richard H. Washburn, Entomology Department, Agricultural Experiment Station, Palmer 99645
Arizona	Dr. J. N. Roney, Extension Entomologist, University of Arizona, 1201 W. Madison Street, Phoenix 85005
Arkansas	Dr. James E. Roberts, Extension Entomologist, University of Arkansas, Fayetteville 72701
California	Mr. R. W. Harper, Chief, Bureau of Entomology, California Department of Agriculture, Sacramento 95814
Colorado	Dr. Leslie B. Daniels, Head, Department of Entomology, Colorado State University, Fort Collins 80521
Connecticut	Mr. J. Peter Johnson, Entomologist, Connecticut Agricultural Experiment Station, P. O. Box 1106, New Haven 06504
Delaware	Dr. Dale F. Bray, Head, Department of Entomology and Applied Ecology, University of Delaware, Newark 19711
Florida	Mr. H. L. Jones, Director, Division of Plant Industry, Florida Department of Agriculture, P. O. Box 1269, Gainesville 32601
Georgia	Mr. Carl M. Scott, Jr., Director, Division of Entomology, Georgia Department of Agriculture, Capital Square, Atlanta 30334
Hawaii	Mr. C. J. Davis, Chief, Entomology Branch, Department of Agriculture, P. O. Box 5425, Honolulu 96814
Idaho	Dr. H. C. Manis, Head, Department of Entomology, University of Idaho, Moscow 83843
Illinois	Dr. H. B. Petty, Jr., Extension Entomologist, Illinois Agricultural Extension Service, 280 Natural Resources Building, Urbana 61803
Indiana	Dr. John V. Osmun, Head, Department of Entomology, Purdue University, Lafayette 47907
Iowa	Dr. Oscar E. Tauber, Acting Survey Coordinator, Chairman, Department of Zoology and Entomology, 253 Science Building, Iowa State University, Ames 50010
Kansas	Dr. Herbert Knutson, Head, Department of Entomology, Waters Hall, Kansas State University, Manhattan 66502
Kentucky	Dr. Lee H. Townsend, State Entomologist and Chairman, Department of Entomology, University of Kentucky, Lexington 40506
Louisiana	Dr. L. D. Newsom, Head, Entomology Research, Louisiana State University, Baton Rouge 70803
Maine	Dr. G. W. Simpson, Head, Department of Entomology, University of Maine, Orono 04473
Maryland	Mr. T. L. Bissell, Extension Entomologist, Department of Entomology, University of Maryland, College Park 20742

Massachusetts Dr. H. E. Wave, Department of Entomology and Plant Pathology, College of Agriculture, University of Massachusetts, Amherst 01002

Michigan Dr. Gordon E. Guyer, Head, Department of Entomology, Michigan State University, East Lansing 48823

Minnesota Dr. D. M. Coe, Director, Division of Plant Industry, Minnesota Department of Agriculture, State Office Building, St. Paul 55101

Mississippi Dr. J. R. Brazzel, Head, Department of Entomology, Mississippi State University, State College 39762

Missouri Mr. George Thomas, Extension Entomologist, Department of Entomology, 1-87 Agriculture Building, University of Missouri, Columbia 65201

Montana Dr. J. H. Pepper, Head, Department of Zoology and Entomology, Montana State University, Bozeman 59715

Nebraska Dr. Earle S. Raun, Chairman, Department of Entomology, University of Nebraska, Lincoln 68503

Nevada Mr. Lee M. Burge, Director, Division of Plant Industry, Nevada Department of Agriculture, P. O. Box 1209, Reno 89504

New Hampshire Dr. J. G. Conklin, State Entomologist, University of New Hampshire, Nesmith Hall, Durham 03824

New Jersey Dr. B. B. Pepper, Chairman, Department of Entomology, College of Agriculture, Rutgers University, New Brunswick 08903

New Mexico Mr. Dallas Rierson, Director, New Mexico Department of Agriculture, New Mexico State University, University Park Box 189, Las Cruces 88001

New York Dr. A. A. Muka, Extension Entomologist, Department of Entomology and Limnology, College of Agriculture, Cornell University, Ithaca 14840

North Carolina Dr. Gerald T. Weekman, Extension Entomologist, North Carolina State University, P. O. Box 5212, State College Station, Raleigh 27607

North Dakota Dr. J. R. Dogger, Chairman, Department of Entomology, North Dakota State University, Fargo 58102

Ohio Dr. Roy W. Rings, Ohio Agricultural Research and Development Center, Wooster 44691

Oklahoma Dr. D. E. Howell, Head, Department of Entomology, Oklahoma State University, Stillwater 74074

Oregon Mr. George H. Moose, Chief, Plant Division, Oregon State Department of Agriculture, Agriculture Building, Salem 97310

Pennsylvania Mr. Stanley Gesell, Extension Entomologist, 200 Walker Laboratory, Pennsylvania State University, University Park 16802

Puerto Rico Agricultural Experiment Station, University of Puerto Rico, Rio Piedras 00931

Rhode Island Dr. F. L. Howard, Chairman, Department of Plant Pathology and Entomology, University of Rhode Island, Kingston 02881

South Carolina Mr. W. C. Nettles, Leader, Extension Entomology and Plant Disease Work, Clemson University, Clemson 29631

South Dakota Dr. R. J. Walstrom, Head, Department of Entomology and Zoology, South Dakota State University, Brookings 57006



Tennessee	Dr. S. E. Bennett, Department of Agricultural Biology, University of Tennessee, P. O. Box 1071, Knoxville 37901
Texas	Dr. J. C. Gaines, Head, Department of Entomology, Texas A & M University, College Station 77843
Utah	Dr. George F. Knowlton, Extension Entomologist, Utah State University, Logan 84321
Vermont	Mr. John W. Scott, Director, Division of Plant Pest Control, Vermont Department of Agriculture, Montpelier 05601
Virginia	Dr. J. M. Grayson, Head, Department of Entomology, Virginia Polytechnic Institute, Blacksburg 24061
Washington	Dr. Horace S. Telford, Chairman, Department of Entomology, Washington State University, Pullman 99164
West Virginia	Dr. C. K. Dorsey, Professor of Entomology, West Virginia University, Morgantown 26506
Wisconsin	Mr. Philip W. Smith, WSDA-Plant Industry Division, Hill Farms State Office Building, Room 202B, Madison 53702
Wyoming	Dr. W. D. Fronk, Professor, Plant Science Division, University of Wyoming, University Box 3354, Laramie 82070

COOPERATIVE SURVEY ENTOMOLOGISTS

Alabama	Mr. H. Frank McQueen, Cooperative Extension Service, Auburn University, Auburn 36830
Arizona	Mr. Dale G. Fullerton, State Capitol Annex, P. O. Box 6189, Phoenix 85005
Arkansas	Mr. W. P. Boyer, Department of Entomology, University of Arkansas, Fayetteville 72701
California	Mr. Ronald M. Hawthorne, California Department of Agriculture, 1220 N. Street, Sacramento 95814
Colorado	Mr. Leonard E. Jenkins, Department of Entomology, Colorado State University, Fort Collins 80521
Delaware	Modified Agreement
Florida	Mr. Frank W. Mead, Division of Plant Industry, Florida Department of Agriculture, P. O. Box 1269, Gainesville 32603
Hawaii	Mr. George Funasaki, Department of Agriculture, P. O. Box 5425, Honolulu 96814
Illinois	Mr. Clarence E. White, Illinois Agricultural Extension Service, 280 Natural Resources Building, Urbana 61803
Indiana	Mr. Roger T. Huber, Department of Entomology, Purdue University, Lafayette 47907
Kansas	Mr. John H. Simpson, Department of Entomology, Kansas State University, Manhattan 66502
Maryland	Dr. Wallace C. Harding, Jr., Department of Entomology, University of Maryland, College Park 20742
Michigan	Dr. A. C. Dowdy, Department of Entomology, Michigan State University, East Lansing 48823
Minnesota	Mr. Robert Flaskerd, Division of Plant Industry, Minnesota Department of Agriculture, 670 State Office Building, St. Paul 55101
Mississippi	Modified Agreement
Missouri	Mr. Ralph E. Munson, Department of Entomology, 1-87 Agriculture Building, University of Missouri, Columbia 65201
Nebraska	Mr. Jon J. Rhine, 201 Plant Industry, East Campus, University of Nebraska, Lincoln 68503
Nevada	Mr. Robert C. Bechtel, Nevada Department of Agriculture, P. O. Box 1209, Reno 89504
New Mexico	Modified Agreement
North Carolina	Vacancy
North Dakota	Mr. William J. Brandvik, Assistant State Entomologist, Office of State Entomologist, State University Station, Fargo 58102
Ohio	Mr. Robert I. Rose, Zoology-Entomology Department, Ohio Agricultural Research and Development Center, Wooster 44691
Oklahoma	Mr. Donald C. Arnold, Department of Entomology, Oklahoma State University, Stillwater 74074



Rhode Island	Modified Agreement
South Dakota	Dr. P. A. Jones, Entomology-Zoology Department, South Dakota State University, Brookings 57006
Texas	Mr. F. W. Parker, Department of Entomology, Texas A & M University, College Station 77843
Virginia	Mr. Oscar W. Isakson, Department of Entomology, Virginia Polytechnic Institute, Blacksburg 24061
Wisconsin	Mr. Marlin S. Conrad, WSDA-Plant Industry Division, Hill Farms State Office Building, Room 202B, Madison 53702
Wyoming	Mr. W. D. Marks, Plant Science Division, University of Wyoming, Box 3354 University Station, Laramie 82070

the survey reveals where and how many grasshoppers infest  
densities, and indicate those areas where control may be neces-

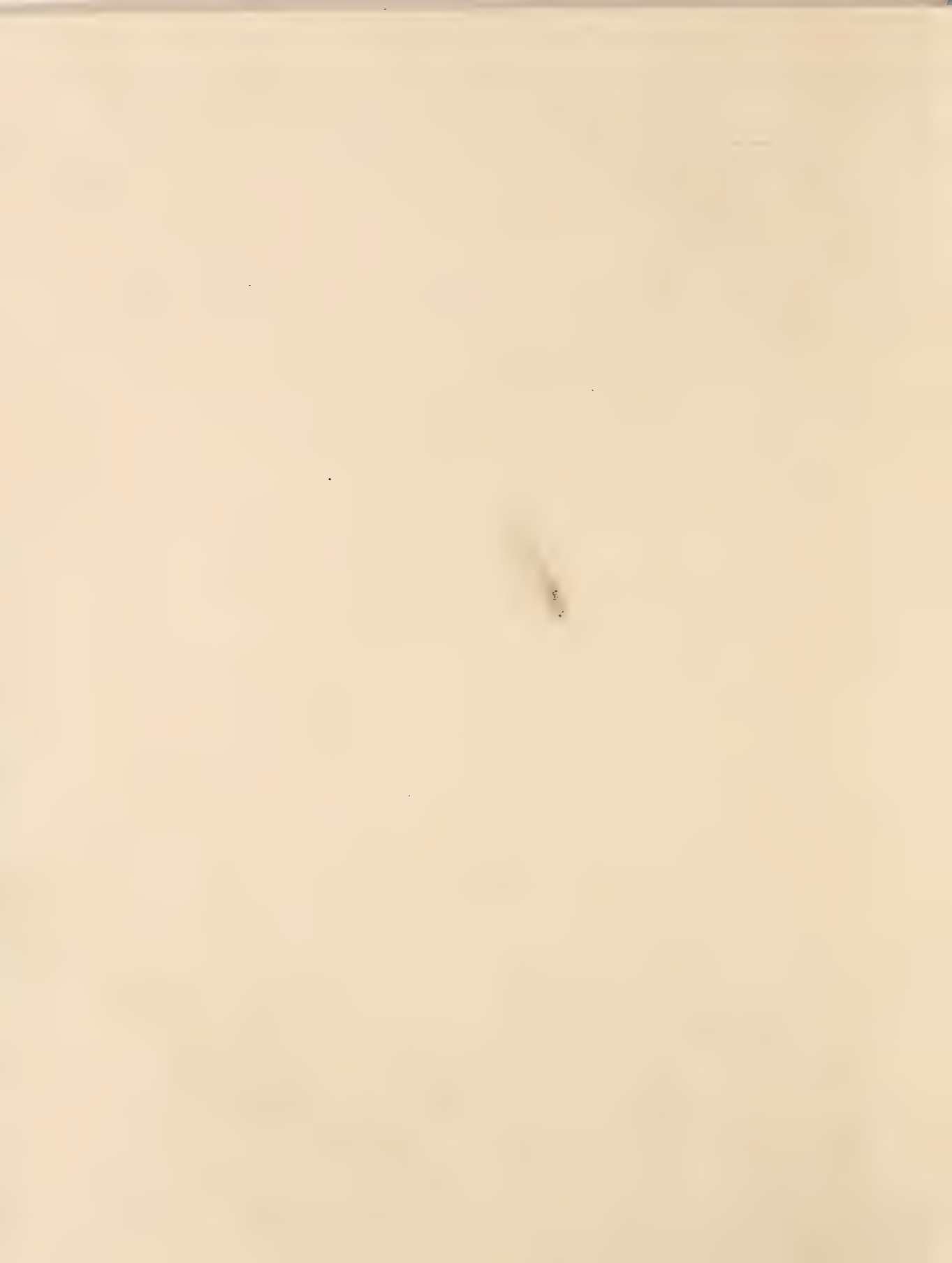
personnel. The infested rangeland areas total 11,393,387 acres

**FALL 1966.**

LANDOWNERSHIP - ACRES		TOTAL ACRES
Private and State	Public Domain	
471,700	562,300	2,034,000
6,000	31,000	37,000
115,400	165,860	281,260
26,000	800	26,800
504,400	206,600	1,711,000
1,500	--	1,500
667,900	--	667,900
572,280	--	2,572,280

ious State agencies concerned.





UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

TO COOPERATORS:

This map is based upon the results of cooperative grasshopper adult surveys made during the late summer and fall of 1966. The survey reveals where and how many grasshoppers infest an area, and indicates the potential severity of infestations for 1967. Nymphal surveys, made in the spring, determine population densities, and indicate those areas where control may be necessary in 1967.

Control on grasshopper infested croplands will be handled by the farmers with technical assistance from Division and State personnel. The infested rangeland areas total 11,393,387 acres in 17 Western and Midwestern States. Areas on the map are diagrammatic. Within these areas, infestations may be solid or spotted.

RANGELAND GRASSHOPPER INFESTATIONS – ACREAGE BY REGIONS, FALL 1966.

(Areas Shown in Red)

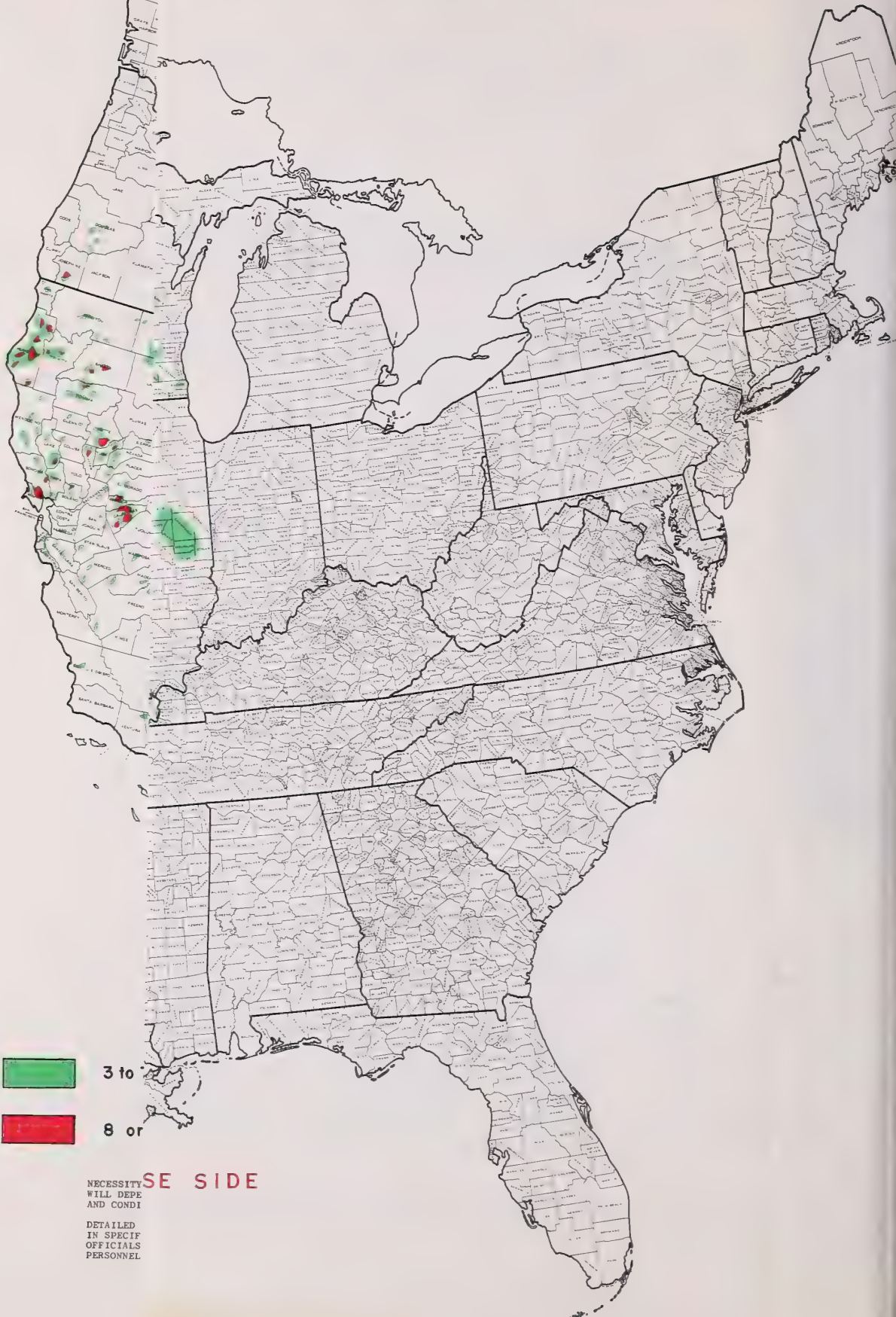
REGION AND STATE	LANDOWNERSHIP – ACRES		TOTAL ACRES	REGION AND STATE	LANDOWNERSHIP – ACRES		TOTAL ACRES
	Private and State	Public Domain			Private and State	Public Domain	
CENTRAL							
Kansas	50,000	--	50,000	New Mexico	1,471,700	562,300	2,034,000
Nebraska	98,000	2,000	100,000	Oregon	6,000	31,000	37,000
South Dakota	53,660	28,280	81,940	Utah	115,400	165,860	281,260
WESTERN				Washington	26,000	800	26,800
Arizona	1,300	4,400	5,700	Wyoming	1,504,400	206,600	1,711,000
California	128,957	450	129,407	SOUTHERN			
Colorado	5,000	1,000	6,000	Arkansas	1,500	--	1,500
Idaho	32,300	65,000	97,300	Oklahoma	667,900	--	667,900
Montana	3,223,000	350,000	3,573,000	Texas	2,572,280	--	2,572,280
Nevada	3,700	14,600	18,300				

The survey was planned and performed by the Plant Pest Control Division, Agricultural Research Service, in cooperation with various State agencies concerned.



# VEY

Rhod  
Sout  
Texa  
Virg  
Wis  
Wyo



3 to  
8 or

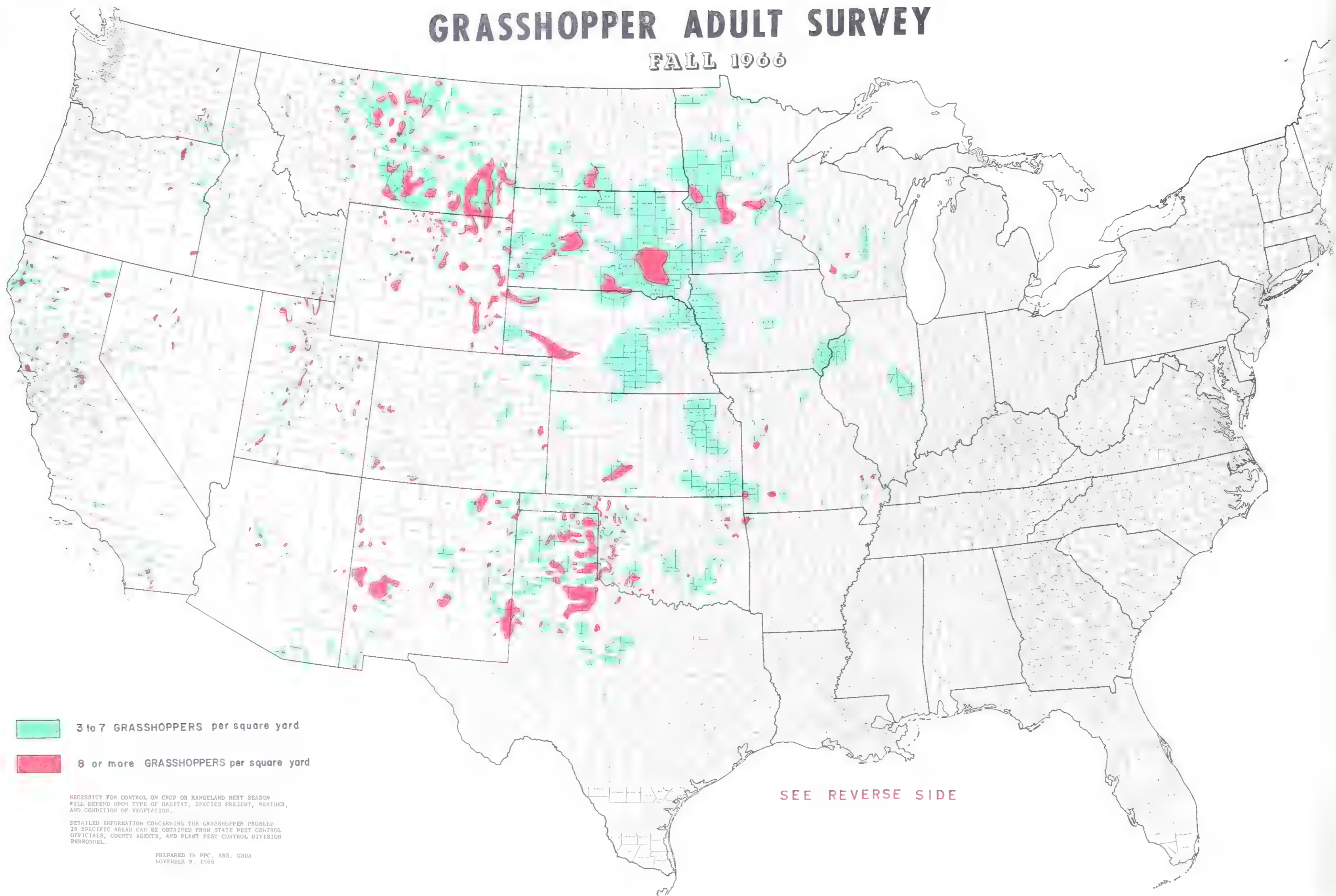
NECESSITY WILL DEPE AND CONDI  
SE SIDE  
DETAILED IN SPECIF OFFICIALS PERSONNEL





# GRASSHOPPER ADULT SURVEY

FALL 1966



 3 to 7 GRASSHOPPERS per square yard

 8 or more GRASSHOPPERS per square yard

NECESSITY FOR CONTROL ON CROP OR RANGELAND NEXT SEASON  
WILL DEPEND UPON TYPE OF HABITAT, SPECIES PRESENT, WEATHER,  
AND CONDITION OF VEGETATION.

DETAILED INFORMATION CONCERNING THE GRASSHOPPER PROBLEM  
IN SPECIFIC AREAS CAN BE OBTAINED FROM STATE PEST CONTROL  
OFFICIALS, COUNTY AGENTS, AND PLANT PEST CONTROL DIVISION  
PERSONNEL.

PREPARED IN PPC, ARS, USDA  
NOVEMBER 9, 1966

SEE REVERSE SIDE





UNITED STATES DEPARTMENT OF AGRICULTURE  
Hyattsville, Maryland 20782

POSTAGE AND FEES PAID  
U.S. DEPARTMENT OF AGRICULTURE

OFFICIAL BUSINESS

UN02487 ALO3001BB2PI 4SB 0001  
USDA NAT AGR LIB BELTSVILLE  
BR  
PLANT INDUS STA  
BELTSVILLE MD 20705







